EXECUTIVE SUMMARY

The Hill Air Force Base Operable Unit (OU) 5 groundwater flow and contaminant transport model was revised to better reflect site conditions in the OU 12 area based on information from additional investigations conducted in the OU 12 area since the original modeling was performed. The depth to the top of the clayey silt unit (the top of layer 3) was changed in the model to more accurately depict actual site conditions. Elevations of other layers were adjusted accordingly. Constant head boundary conditions also were adjusted to improve model calibration. Water levels from new monitoring wells installed at OU 12 were added as calibration targets for the model. The updated steady-state flow model had a residual mean of -0.7 feet, an absolute residual mean of 4.1 feet, and a root mean squared error of 5.0 feet. The normalized root mean squared error was 0.01, indicating a well-calibrated model. Changes to the transport model included minor changes to the source mass flux, source release timing, and more importantly, changes to the degradation rate for trichloroethene (TCE). The degradation rate was reduced based on values calculated from data from the OU 12 TCE plume, and the relative lack of evidence of biodegradation at OU 12. The simulated plume closely matched the existing plume in length, width, and concentration. However, the axis of the plume is slightly south (by 100 to 200 feet) of the actual plume axis, due to subtle differences in the actual piezometric surface versus the modeled piezometric surface.

The calibrated flow and transport model was used to predict future contaminant migration under a variety of scenarios assuming a continuing source of contamination was present (buried drums). Predictive simulations for natural attenuation indicated that while the 1,000 µg/l TCE contour is stable, the TCE plume, as defined by the 5 µg/l contour, will continue to expand, reaching the domain boundary (3600 West in Roy) after 18 years. The model also was used to simulate a hydraulic containment system at the Base boundary. The results of this modeling were used to assist with the design of the OU 12 Base Boundary Hydraulic Containment System. Both five-well and three-well systems were modeled and indicated that groundwater contaminated with TCE at concentrations greater than 100 µg/l could be contained at the Base boundary with extraction wells.